

AMENDMENTS TO THE SPECIFICATION

Please replace paragraph [0008] with the following amended paragraph:

[0008] According to another embodiment of the invention a computer readable medium storing computer readable program code for causing a computer to present an option GUI Graphical User Interface (GUI) to a user; receive test parameters from the user via the GUI; read an AFM data file based on the input test parameters; plot a graph of the deflection of the cantilever versus a position of the cantilever in a GUI; present in a GUI a first user actuated interface for initiating an analysis; and perform an elasticity analysis of the data file based on the input parameters in response to actuation of the first user actuated interface.

Please replace paragraph [00022] with the following amended paragraph:

[00022] An AFM such as that shown in Figure 1 can be used to gather data used in an elasticity analysis. The AFM is operated in an indentation mode. In the indentation mode, a head of the microscope 10 is moved towards and away from the sample in a direction substantially perpendicular to the surface of the sample being measured. The piezoelectric controllers position the AFM at a precise location along the X and Y-axes. The X and Y-axes define the plane of the surface of the sample. Once the AFM is in the desired position, the piezoelectric controllers then move the cantilever 12 along the Z-axis towards the surface of the sample 16. As the tip 14 on the cantilever 12 is moved toward the surface of the sample 16, the cantilever 12 deflects in response to various forces on it.; As the cantilever 12 engages the sample, the tip 14 of the cantilever 12 may begin to penetrate the surface of the sample 16, to a degree that depends on the hardness of the sample. This penetration causes an indentation in the sample. The cantilever continues to moves towards the sample until a selected distance is reached. The cantilever then begins to move away from the sample. As the cantilever moves, the deflection of the cantilever tip and the cantilever position are measured. The AFM is then moved to another position in the X, Y plane and the process is repeated. The measured data can then be used to determine the depth of the indentation and the elasticity of the sample.

Please replace paragraph [00036] with the following amended paragraph:

[00036] The amount of residual error depends largely on the estimated initial contact point. An analysis performed at other contact points may produce a better result. Therefore a process for reducing or minimizing the residual error is performed in step 35. In an exemplary embodiment, the steps 31-35 are repeated using new values for the initial contact point until the residual errors are minimized or reduced. The new values of the initial contact point are constrained to the curve of interest, that is the curve 56, 58 or mean thereof used in the calculating the indentation depth in step 33. In the described example, the initial contact point is changed simply by sliding it along the curve of interest. For example, fifty data points to the left of the initially estimated contact point 67 and fifty data points to the right of the initially estimated contact point can be used as subsequent guesses for the initial contact point. These points need not be consecutive nor uniformly spaced. For calculation efficiency, adaptive step sizing may be used, with the spacing of guesses decreasing in the neighborhood of error minima. The process continues to step 32 and a new indentation depth is computed using an ideal curve extending from the new initial contact point. For each guess of the initial contact point, indentation depths are recomputed and new nonlinear fits are performed per step 33. The residual errors for the newly calculated indentation depths are then compared with each other. The contact point that provides the lowest residual error is selected. Then, the computed versus predicted errors and results using the selected contact point can be plotted and displayed to a user. Additionally, the results may be archived as shown in the flow chart of Figure 2